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## SEQUENCE LISTING

&lt;110&gt; AMGEN INC., et al.

&lt;120&gt; HAMMERHEAD RIBOZYMES

&lt;130&gt; 06843.0048-00304

&lt;140&gt;

&lt;141&gt;

&lt;150&gt; 60/389,147

&lt;151&gt; 2002-06-13

&lt;160&gt; 147

&lt;170&gt; PatentIn Ver. 2.1

&lt;210&gt; 1

&lt;211&gt; 79

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Synthetic template A

oligonucleotide

&lt;220&gt;

&lt;221&gt; modified\_base

&lt;222&gt; (17)..(24)

&lt;223&gt; a, t, c or g

&lt;400&gt; 1

gggatttacc cggcagnnnn nnnnatccag ctgatgagtc ccaaatagga cgaaacgcct 60

tegggcgtcc tggatctgc 79

&lt;210&gt; 2

&lt;211&gt; 33

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer

&lt;400&gt; 2

taatacgact cactataggg atttaccgag cag 33

&lt;210&gt; 3

&lt;211&gt; 18

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer

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<400> 3  
gcagatccag gacgcccg 18

<210> 4  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic antisense-A  
oligonucleotide

<400> 4  
gtcctatttg ggactcatca gctggat 27

<210> 5  
<211> 66  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic template B  
oligonucleotide

<220>  
<221> modified\_base  
<222> (27)..(32)  
<223> a, t, c or g

<400> 5  
gggacttaag ccactgatg agtcgcnnnn nngcgacgaa acgccttcgg gcgtctgggc 60  
agtccc 66

<210> 6  
<211> 34  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 6  
taatacgact cactataggg acttaagccc actg 34

<210> 7  
<211> 29  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 7  
gggactgccc agacgcccga aggcgtttc 29

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<210> 8  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: antisense B  
oligonucleotide

<400> 8  
gcgactcatc agtgggctta agtccc

26

<210> 9  
<211> 79  
<212> RNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<220>

<221> modified\_base

<222> (17)..(24)

<223> a, u, c or g

<400> 9  
gggauuuacc cggcagnnnn nnnnauccag cugaugaguc caaaauagga cgaaacgccu 60  
ucgggcgucc uggaucugc 79

<210> 10

<211> 78

<212> RNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 10  
gggauuuacc cggcaggggc uacgauccag cugaugaguc caaaauagga cgaaacgcuu 60  
cgggcguccu ggaucugc 78

<210> 11

<211> 76

<212> RNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

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<400> 11  
gauuuacccg gcagggggcua cgauccagcu gaugagucc aaauaggacg aaacgccucg 60  
ggcguccugg aucugc 76

<210> 12  
<211> 78  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 12  
gggauuuacc cggcaggggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

<210> 13  
<211> 78  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 13  
gggauuuacc cggcaggggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

<210> 14  
<211> 78  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 14  
gggauuuacc cggcaggggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

<210> 15  
<211> 78  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 15  
gggauuuacc cggcaggggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60

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cgggcguccu ggaucugc

78

&lt;210&gt; 16

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 16

gggauuuacc cggcaggggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 17

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 17

gggauuuacc cggcaggggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 18

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 18

gggauuuacc cggcaggggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 19

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 19

gggauuuacc cggcaggggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

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<210> 20  
<211> 78  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 20  
gggauuuuacc cggcagggggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

<210> 21  
<211> 78  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 21  
ugauuuuacc cggcagggggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

<210> 22  
<211> 78  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 22  
gggauuuuacc cggcagcgggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

<210> 23  
<211> 78  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 23  
gggauuuuacc cggcagcgggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

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<210> 24  
<211> 78  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 24  
gggaauuacc cggcagcggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

<210> 25  
<211> 77  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 25  
gggaauuacc cggcagcggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucug 77

<210> 26  
<211> 63  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 26  
gggaauuacc cggcagcggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgg 63

<210> 27  
<211> 78  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 27  
gggaauuacc cggcaguggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

<210> 28  
<211> 78

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&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 28

gggauuuacc cggcaguggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 29

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 29

gggauuuacc cggcaguggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 30

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 30

gggauuuacc cggcaguggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 31

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 31

gggauuuacc cggcagaggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 32

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

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&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 32

gggaauuacc cggcagagggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 33

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 33

gggaauuacc cggcagagggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 34

&lt;211&gt; 64

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 34

gggaauuacc cggcagagggc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 64

&lt;210&gt; 35

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 35

gggaauuacc cggcagggcgc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 36

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

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&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 36

gggauuuacc cggcaggcgc uacgauccag cugaugaguc ccaaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 37

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 37

gggauuuacc cggcaggagc uacgauccag cugaugaguc ccaaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 38

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 38

gggauuuacc cggcaggugc uacgauccag cugaugaguc ccaaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 39

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 39

gggauuuacc cggcaggkgc uacgauccag cugaugaguc ccaaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 40

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Synthetic

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## oligonucleotide

&lt;400&gt; 40

gggaauuacc cggcaggmgc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 41

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 41

gggaauuacc cggcaguugc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 42

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 42

gggaauuacc cggcaguugc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 43

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 43

gggaauuacc cggcagaagc uacgauccag cugaugaguc ccaaauagga cgaaacgccu 60  
cgggcguccu ggaucugc 78

&lt;210&gt; 44

&lt;211&gt; 56

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

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<400> 44  
gggauuuacc cggcagcagc uacgauccag ugaugagucc caaaauaggac gaaacg 56

<210> 45  
<211> 66  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<220>  
<221> modified\_base  
<222> (27)..(32)  
<223> a, u, c or g

<400> 45  
gggacuuaag cccacugaug agucgcnnnn nngcgacgaa acgccuucgg gcgucugggc 60  
aguccc 66

<210> 46  
<211> 65  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 46  
gggacuuaag cccacugaug agucgcuggg augcgacgaa acgccuucgg gcgucugggc 60  
agucc 65

<210> 47  
<211> 63  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 47  
gggacuuaag cccacugaug agucgcuggg augcgacgaa acgccuucgg gcaucacgaa 60  
uuc 63

<210> 48  
<211> 66  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic

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## oligonucleotide

&lt;400&gt; 48

uggacuuaag cccacugaug agucgcuggg augcgacgaa acgccuucgg gcgucugggc 60  
aguccc 66

&lt;210&gt; 49

&lt;211&gt; 53

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 49

gggacuuaag cccacugaug agucgcuggg augcgacgaa acgccuucgg gcg 53

&lt;210&gt; 50

&lt;211&gt; 66

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 50

uggacuuaag cccacugaug agucgcuggg augcgacgaa acgccuucgg gcgucugggc 60  
aguccc 66

&lt;210&gt; 51

&lt;211&gt; 66

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 51

uggacuuaag cccacugaug agucgcugcg augcgacgaa acgccuucgg gcgucugggc 60  
aguccc 66

&lt;210&gt; 52

&lt;211&gt; 66

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

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<400> 52  
ugaucuuaag cccacugaug agucgcugcg augcgacgaa acgccuucgg gcgucugggc 60  
aguccc 66

<210> 53  
<211> 52  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 53  
gggacuuaag cccacugaug agucgcugwg augcgacgaa acgccuucgg gc 52

<210> 54  
<211> 61  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 54  
gggacuuaag cccacugaug agucgcugga augcgacgaa acgccuucgg aucacgaauu 60  
c 61

<210> 55  
<211> 70  
<212> RNA  
<213> *Notophthalmus viridescens*

<400> 55  
uuggauucaaa gcuagccugg cugaugaagg gugauacca gaaaccgguc cuaggauucu 60  
uuguuuccgg 70

<210> 56  
<211> 66  
<212> RNA  
<213> *Ambystoma talpoideum*

<400> 56  
gacccaagcu acuccucacu gaugaggccc aacaaggcug aaacauguuu ggggaugcuu 60  
gugguc 66

<210> 57  
<211> 61  
<212> RNA  
<213> *Amphiuma tridactylum*

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&lt;400&gt; 57

cuaaagcugc accucacuga ugaugcccaa ugaggcugaa acgcguuugg gguugcuuga 60  
g 61

&lt;210&gt; 58

&lt;211&gt; 69

&lt;212&gt; RNA

&lt;213&gt; Schistosoma mansoni

&lt;400&gt; 58

ggcagguaca uccagcugac gaguccaaa uaggacgaaa ugccuucggg cauccuggau 60  
uccacugcu 69

&lt;210&gt; 59

&lt;211&gt; 71

&lt;212&gt; RNA

&lt;213&gt; Dolichopoda baccettii

&lt;400&gt; 59

guguguuccc ucugccccgc ugaugagguc ggggagaccg aaagggucac cucuacgggg 60  
cuauuacau c 71

&lt;210&gt; 60

&lt;211&gt; 78

&lt;212&gt; RNA

&lt;213&gt; Dolichopoda schiavazzii

&lt;400&gt; 60

gauguguguu cccucugccc cgcugaugag gucagggag accgaaaggg ucgacucua 60  
ggggcuauaa caugcaau 78

&lt;210&gt; 61

&lt;211&gt; 40

&lt;212&gt; RNA

&lt;213&gt; Avocado sunblotch viroid

&lt;400&gt; 61

ggaaagaugg gaagaacacu gaugagucuc gcaagguua 40

&lt;210&gt; 62

&lt;211&gt; 40

&lt;212&gt; RNA

&lt;213&gt; Avocado sunblotch viroid

&lt;400&gt; 62

uaacuuguu uugacgaaac caggucuguu ccgacuuucc 40

&lt;210&gt; 63

&lt;211&gt; 30

&lt;212&gt; RNA

&lt;213&gt; Avocado sunblotch viroid

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<400> 63  
uucccaucuu ucccugaaga gacgaaguga 30

<210> 64  
<211> 34  
<212> RNA  
<213> Avocado sunblotch viroid

<400> 64  
ucacaagucg aaacucagag ucggaaaguc ggaa 34

<210> 65  
<211> 44  
<212> RNA  
<213> Unknown Organism

<220>  
<223> Description of Unknown Organism: Carnation small  
viroid-like RNA

<400> 65  
uucgagccuu accgacacug augagccaag aggaacuugg aggc 44

<210> 66  
<211> 52  
<212> RNA  
<213> Unknown Organism

<220>  
<223> Description of Unknown Organism: Carnation small  
viroid-like RNA

<400> 66  
gccuccaagg ggccuggagg cgaaaccccg gggucuguug ggaccacucg ga 52

<210> 67  
<211> 59  
<212> RNA  
<213> Unknown Organism

<220>  
<223> Description of Unknown Organism: HH2 RNA sequence

<400> 67  
gcgaugaccu gaugaggccg aaaggccgaa acguucucgc gagagaacgu cgucgucgc 59

<210> 68  
<211> 55  
<212> RNA  
<213> Unknown Organism

<220>  
<223> Description of Unknown Organism: Small circular

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## cherry RNA

<400> 68  
augcuguagu gggaugugug ucucaccuga agaggacaaa aguccgaaac gguau 55

<210> 69

<211> 51

<212> RNA

<213> Unknown Organism

<220>

<223> Description of Unknown Organism: Small circular  
cherry RNA

<400> 69  
gcuauauggg gauguguguc ccuacugacg aguucacaaag aacgaaauag u 51

<210> 70

<211> 55

<212> RNA

<213> Lucerne transient streak virus

<400> 70  
uacgucugag cgugauaccc gcucacugaa gauggcccgg uagggccgaa acgua 55

<210> 71

<211> 60

<212> RNA

<213> Lucerne transient streak virus

<400> 71  
gacguaugag acugacugaa acgccgucuc acugaugagg ccauggcagg ccgaaacguc 60

<210> 72

<211> 52

<212> RNA

<213> Tobacco ringspot virus

<400> 72  
ccugucaccg gaugugcuuu ccggucugau gaguccguga ggacgaaaca gg 52

<210> 73

<211> 54

<212> RNA

<213> Arabis mosaic virus

<400> 73  
acugucgccg gauguguauc cgaccugacg auggcccaaa agggccgaaa cagu 54

<210> 74

<211> 53

18/33

&lt;212&gt; RNA

&lt;213&gt; Chicory yellow mottle virus

&lt;400&gt; 74

uacugucgcc agacguggac ccggccugau gaguccgaaa ggacgaaaca gua 53

&lt;210&gt; 75

&lt;211&gt; 51

&lt;212&gt; RNA

&lt;213&gt; Barley yellow dwarf virus

&lt;400&gt; 75

ggugucuaa ggugcguacc uugacugaug aguccgaaag gacgaaacac c 51

&lt;210&gt; 76

&lt;211&gt; 89

&lt;212&gt; RNA

&lt;213&gt; Barley yellow dwarf virus

&lt;400&gt; 76

guggauaaca gagcgcuac ugucugacga cguauccgcg cggacuagaa ggcuggugcc 60  
ucguccaaca aaugauaca gaaauccac 89

&lt;210&gt; 77

&lt;211&gt; 54

&lt;212&gt; RNA

&lt;213&gt; Peach latent mosaic viroid

&lt;400&gt; 77

gaagagucug ugcuaagcac acugacgagu cucugagaug agacgaaacu cuuc 54

&lt;210&gt; 78

&lt;211&gt; 56

&lt;212&gt; RNA

&lt;213&gt; Peach latent mosaic viroid

&lt;400&gt; 78

ucauaagucu gggcuaagcc cacugaugag ucgcugaaau gcgacgaaac uuauga 56

&lt;210&gt; 79

&lt;211&gt; 61

&lt;212&gt; RNA

&lt;213&gt; Chrysanthemum chlorotic mottle virus

&lt;400&gt; 79

aagaggucgg caccugacgu cgguguccug augaagauc augacaggau cgaaaccucu 60  
u 61

&lt;210&gt; 80

&lt;211&gt; 81

&lt;212&gt; RNA

&lt;213&gt; Chrysanthemum chlorotic mottle virus

19/33

<400> 80  
uccagucgag accugaagug gguuuccuga ugaggcugug gagagagcga aagcuuuacu 60  
cccacacaag ccgaaacugg a 81

<210> 81  
<211> 54  
<212> RNA  
<213> Subterranean clover mottle virus

<400> 81  
cgcugucugu acuuguaucg guacacugac gagucccuaa aggacgaaac agcg 54

<210> 82  
<211> 50  
<212> RNA  
<213> Velvet tobacco mottle virus

<400> 82  
uccguagugg auguguaucg acucugauga guccgaaagg acgaaacgga 50

<210> 83  
<211> 66  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Illustrative  
randomized RNA sequence for isolating I/III  
trans-cleaving hammerhead ribozymes

<220>  
<221> modified base  
<222> (27) .. (32)  
<223> a, u, c or g

<400> 83  
gggacugaag cccacugaug agucgcnnnn nngcgacgaa acgccuucgg gcgucugggc 60  
aguccc 66

<210> 84  
<211> 76  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
template oligonucleotide

<400> 84  
taatacgact cactatggga cctgtcaccg gatgtgcttt ccggtctgat gagtccgtga 60  
ggacgaaaca ggtccc 76

20/33

<210> 85  
<211> 78  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
template oligonucleotide

<400> 85  
taatacgact cactatggga tacgtctgag cgtgataccc gctcactgaa gagggccggt 60  
agggccgaaa cgtatccc 78

<210> 86  
<211> 79  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
template oligonucleotide

<400> 86  
taatacgact cactatggga tcataagtct gggctaagcc cactgatgag tcgctgaaat 60  
gcgacgaaac ttatgatcc 79

<210> 87  
<211> 76  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
template oligonucleotide

<400> 87  
taatacgact cactatggga cctgtcaccg gatgatacct ccggtctgat gagtccgtga 60  
ggacgaaaca ggtccc 76

<210> 88  
<211> 78  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
template oligonucleotide

<400> 88  
taatacgact cactatggga cctgtcaccg gatgtgcttt ccggtctgat gagtcccggt 60  
agggacgaaa cagggtccc 78

<210> 89  
<211> 78

21/33

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
template oligonucleotide

&lt;400&gt; 89

taatacgact cactatggga cctgtcaccg gatgatacct ccggtctgat gagtcccggg 60  
agggacgaaa caggtccc 78

&lt;210&gt; 90

&lt;211&gt; 70

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
template oligonucleotide

&lt;400&gt; 90

taatacgact cactatggga cctgtcaccg gtaaccgggc tgatgagtc gtgaggacga 60  
aacaggtccc 70

&lt;210&gt; 91

&lt;211&gt; 80

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
template oligonucleotide

&lt;400&gt; 91

taatacgact cactatggga cctgtcaccg gatgtgcttt ccggtctgat gagtccctga 60  
aatgggacga aacaggtccc 80

&lt;210&gt; 92

&lt;211&gt; 74

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
template oligonucleotide

&lt;400&gt; 92

taatacgact cactatggga cctgtcaccg gtaaccgggc tgatgagtc ctgaaatggg 60  
acgaaacagg tccc 74

&lt;210&gt; 93

&lt;211&gt; 26

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

22/33

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
antisense oligonucleotide

&lt;400&gt; 93

cacggactca tcagaccgga aagcac

26

&lt;210&gt; 94

&lt;211&gt; 27

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
antisense oligonucleotide

&lt;400&gt; 94

accgggcctc ttcagtgage gggatc

27

&lt;210&gt; 95

&lt;211&gt; 26

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
antisense oligonucleotide

&lt;400&gt; 95

atttcagcga ctcacagtg ggccta

26

&lt;210&gt; 96

&lt;211&gt; 26

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
antisense oligonucleotide

&lt;400&gt; 96

cacggactca tcagaccgga ggtatc

26

&lt;210&gt; 97

&lt;211&gt; 27

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
antisense oligonucleotide

23/33

<400> 97  
taccgggact catcagaccg gaaagca 27

<210> 98  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
antisense oligonucleotide

<400> 98  
taccgggact catcagaccg gaggtat 27

<210> 99  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
antisense oligonucleotide

<400> 99  
tcacggactc atcagaccgg tta 23

<210> 100  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
antisense oligonucleotide

<400> 100  
ttcagggact catcagaccg gaaagca 27

<210> 101  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
antisense oligonucleotide

<400> 101  
atttcaggga ctcatcagac cggtta 26

<210> 102  
<211> 60

24/33

&lt;212&gt; RNA

&lt;213&gt; Tobacco ringspot virus

&lt;400&gt; 102

gggacccguc accggaugug cuuuccgguc ugaugagucc gugaggacga aacaggucc 60

&lt;210&gt; 103

&lt;211&gt; 60

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
chimeric ribozyme RNA sequence

&lt;400&gt; 103

gggacccguc accggaugau accuccgguc ugaugagucc gugaggacga aacaggucc 60

&lt;210&gt; 104

&lt;211&gt; 62

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
chimeric ribozyme RNA sequence

&lt;400&gt; 104

gggacccguc accggaugau accuccgguc ugaugagucc cgguagggac gaaacagguc 60  
cc 62

&lt;210&gt; 105

&lt;211&gt; 62

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
chimeric ribozyme RNA sequence

&lt;400&gt; 105

gggacccguc accggaugug cuuuccgguc ugaugagucc cgguagggac gaaacagguc 60  
cc 62

&lt;210&gt; 106

&lt;211&gt; 62

&lt;212&gt; RNA

&lt;213&gt; Lucerne transient streak virus

&lt;400&gt; 106

gggauacguc ugagcgugau acccgcucac ugaugaggcc cgguagggcc gaaacgnauc 60  
cc 62

25/33

<210> 107  
<211> 60  
<212> RNA  
<213> Tobacco ringspot virus

<400> 107  
gggacccguc accggaugug cuuuccgguc ugaugagucc gugaggacga aacaggucc 60

<210> 108  
<211> 54  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
chimeric ribozyme RNA sequence

<400> 108  
gggacccguc accgguaacc ggucugauga guccgugagg acgaaacagg uccc 54

<210> 109  
<211> 58  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
chimeric ribozyme RNA sequence

<400> 109  
gggacccguc accgguaacc ggucugauga gucccuaaag ugggacgaaa caggucc 58

<210> 110  
<211> 64  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
chimeric ribozyme RNA sequence

<400> 110  
gggacccguc accggaugug cuuuccgguc ugaugagucc cuaaaguggg acgaaacagg 60  
uccc 64

<210> 111  
<211> 64  
<212> RNA  
<213> Peach latent mosaic viroid

<400> 111  
gggaucuaa gucugggcua agccacuga ugagucgcua aagugcgacg aaacuuauga 60  
uccc 64

26/33

<210> 112  
<211> 60  
<212> RNA  
<213> Tobacco ringspot virus

<400> 112  
gggaccuguc accggaugug cuuuccgguc ugaugagucc gugaggacga aacagguccc 60

<210> 113  
<211> 71  
<212> RNA  
<213> Schistosoma mansoni

<400> 113  
gggcagguac auccagcuga ugagucccaa auacgacgaa acgccuucgg gcguccugga 60  
uuccacugcc c 71

<210> 114  
<211> 43  
<212> RNA  
<213> Schistosoma mansoni

<400> 114  
gcagguacau ccagcugaug agucccaaaau aggacgaaac gcc 43

<210> 115  
<211> 20  
<212> RNA  
<213> Schistosoma mansoni

<400> 115  
ggcguccugg auuccacugc 20

<210> 116  
<211> 71  
<212> RNA  
<213> Schistosoma mansoni

<400> 116  
gggcagguac auccagcuga ugagucccaa auaggacgaa acgccuucgg gcguccugga 60  
uuccacugcc c 71

<210> 117  
<211> 43  
<212> RNA  
<213> Schistosoma mansoni

<400> 117  
gcagguacau ccagcugaug agucccaaaau aggacgaaac gcc 43

27/33

<210> 118  
<211> 20  
<212> RNA  
<213> Schistosoma mansoni

<400> 118  
ggcguccugg auuccacugc 20

<210> 119  
<211> 71  
<212> RNA  
<213> Schistosoma mansoni

<400> 119  
gggcagguac auccagcuga ugagucccaa auaggacgaa acgccuucgg gcguccugga 60  
uuccacugcc c 71

<210> 120  
<211> 84  
<212> RNA  
<213> Dolichopoda baccettii

<400> 120  
caugaugugu guuuccucug ccccgugau gaggucgggg agaccgaaag ggucaacucu 60  
acggggcuau uacaugcaau ggug 84

<210> 121  
<211> 93  
<212> RNA  
<213> Dolichopoda schiavazzii

<400> 121  
guccaucaug auguguguuc ccucugcccc gcugaugagg ucaggggaaga ccgaaagggg 60  
cgacucuacg ggcuuaaca ugcauggug gac 93

<210> 122  
<211> 20  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: I/III  
trans-cleaving hammerhead ribozyme RNA sequence

<400> 122  
ggcguccugg auuccacugc 20

<210> 123  
<211> 43  
<212> RNA  
<213> Artificial Sequence

28/33

&lt;220&gt;

<223> Description of Artificial Sequence: I/III  
trans-cleaving hammerhead ribozyme RNA sequence

&lt;400&gt; 123

gcagguacau ccagcugaug agucccaau aggacgaaac gcc

43

&lt;210&gt; 124

&lt;211&gt; 20

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: I/III  
trans-cleaving hammerhead ribozyme RNA sequence

&lt;400&gt; 124

ggcguccugg auguaccugc

20

&lt;210&gt; 125

&lt;211&gt; 43

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: I/III  
trans-cleaving hammerhead ribozyme RNA sequence

&lt;400&gt; 125

gcagguacau ccagcugaug agucccaau aggacgaaac gcc

43

&lt;210&gt; 126

&lt;211&gt; 43

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: trans-cleaving  
hammerhead ribozyme RNA sequence

&lt;400&gt; 126

gcagguacau ccagcugaug agucccaau aggacgaaac gcu

43

&lt;210&gt; 127

&lt;211&gt; 20

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: trans-cleaving  
hammerhead ribozyme RNA sequence

&lt;400&gt; 127

agcguccugg auuccacugc

20

29/33

<210> 128  
<211> 45  
<212> RNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: trans-cleaving  
hammerhead ribozyme RNA sequence

<400> 128  
gcagguacau ccagcugaug agucccaaaau aggacgaaac ggggg

45

<210> 129  
<211> 25  
<212> RNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: trans-cleaving  
hammerhead ribozyme RNA sequence

<400> 129  
cccccguccu ccuggauucc acugc

25

<210> 130  
<211> 47  
<212> RNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: trans-cleaving  
hammerhead ribozyme RNA sequence

<400> 130  
gcagguacau ccagcugaug agucccaaaau aggacgaaac ggggggg

47

<210> 131  
<211> 24  
<212> RNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: trans-cleaving  
hammerhead ribozyme RNA sequence

<400> 131  
cccccccguc cuggauucca cugc

24

<210> 132  
<211> 47  
<212> RNA  
<213> Artificial Sequence

30/33

&lt;220&gt;

<223> Description of Artificial Sequence: trans-cleaving  
hammerhead ribozyme RNA sequence

&lt;400&gt; 132

gggcagguac auccagcuga ugagucccaa auaggacgaa acggggg

47

&lt;210&gt; 133

&lt;211&gt; 24

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: trans-cleaving  
hammerhead ribozyme RNA sequence

&lt;400&gt; 133

cccccguccu ggauuccacu gccc

24

&lt;210&gt; 134

&lt;211&gt; 17

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: I/III  
trans-cleaving hammerhead ribozyme HH16 RNA  
sequence

&lt;400&gt; 134

gggaacgucg ucgucgc

17

&lt;210&gt; 135

&lt;211&gt; 38

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: I/III  
trans-cleaving hammerhead ribozyme HH16 RNA  
sequence

&lt;400&gt; 135

gcgaugaccu gauuaggccg aaaggccgaa acguuccc

38

&lt;210&gt; 136

&lt;211&gt; 17

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: I/III  
trans-cleaving hammerhead ribozyme HH16 RNA

31/33

## sequence

&lt;400&gt; 136

gggaacgucg ucgucgc

17

&lt;210&gt; 137

&lt;211&gt; 38

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: I/III  
trans-cleaving hammerhead ribozyme HH16 RNA  
sequence

&lt;400&gt; 137

gcgaugaccu gauuaggccg aaaggccgaa acguuccc

38

&lt;210&gt; 138

&lt;211&gt; 71

&lt;212&gt; RNA

&lt;213&gt; Schistosoma mansoni

&lt;400&gt; 138

gggcagguac auccagcuga ugagucccaa auaggacgaa acgccuucgg gcguccugga  
uuccacugc c60  
71

&lt;210&gt; 139

&lt;211&gt; 20

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:  
Shistozyme-modified I/III trans-cleaving  
hammerhead ribozyme RNA sequence

&lt;400&gt; 139

ggcguccugg auuccacugc

20

&lt;210&gt; 140

&lt;211&gt; 43

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:  
Shistozyme-modified I/III trans-cleaving  
hammerhead ribozyme RNA sequence

&lt;400&gt; 140

gcagguacau ccagcugaug agucccaaaau aggacgaaac gcc

43

32/33

<210> 141  
<211> 16  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: TCHR-5:4  
modified I/III trans-cleaving hammerhead ribozyme  
RNA sequence

<400> 141  
ggcguccugg aucugc

16

<210> 142  
<211> 47  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: TCHR-5:4  
modified I/III trans-cleaving hammerhead ribozyme  
RNA sequence

<400> 142  
gcaguccagu acauccagcu gaugaguccc aaauaggacg aaacgcc

47

<210> 143  
<211> 47  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: TCHR-7:6  
trans-cleaving ribozyme RNA sequence

<400> 143  
gggcagguac auccagcuga ugagucccaa auaggacgaa acggggg

47

<210> 144  
<211> 24  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: TCHR-7:6  
trans-cleaving ribozyme RNA sequence

<400> 144  
cccccguccu ggauccacu gccc

24

<210> 145  
<211> 51  
<212> RNA  
<213> Artificial Sequence

33/33

&lt;220&gt;

<223> Description of Artificial Sequence: TCHR-7:6  
trans-cleaving ribozyme RNA sequence

&lt;400&gt; 145

gggcagucca guacauccag cugaugaguc ccaaauagga cgaaacgggg g 51

&lt;210&gt; 146

&lt;211&gt; 20

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: TCHR-7:6  
trans-cleaving ribozyme RNA sequence

&lt;400&gt; 146

cccccguccu ggaucugccc 20

&lt;210&gt; 147

&lt;211&gt; 79

&lt;212&gt; RNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Illustrative  
randomized RNA sequence for isolating I/III  
trans-cleaving hammerhead ribozymes

&lt;220&gt;

&lt;221&gt; modified\_base

&lt;222&gt; (17)..(24)

&lt;223&gt; a, u, c or g

&lt;400&gt; 147

gggaauuacc cggcagnnnn nnnnauccag cugaugaguc ccaaauagga cgaaacgccu 60  
ucgggcgucc uggaucugc 79